4b Analysis for Deadman Creek

The Washington Department of Ecology (Ecology) Integrated Report (IR), which was submitted to EPA in May 2008, has excluded three listings (18827, 18828, and 40534) for temperature and two listings (40554 and 40555) for fecal coliform in Deadman Creek from the 303(d) list and placed these waterbodies in category 4b of the IR. These water bodies were listed in Category 5 of the 2004 IR. Ecology's basis for excluding these waterbodies from the 303(d) list is outlined in this evaluation.

Identification of Segment and Statement of Problem Causing Impairment

Deadman Creek is located in Garfield County in southeastern Washington. It flows through rolling hills before emptying into the Snake River. This is arid country, with rainfall in some areas averaging as little as 11 inches annually. Historically, the surrounding hills were covered in bunchgrass and sage, and the meandering creek provided habitat for Steelhead trout. Approximately half the watershed today is used for non-irrigated crops such as wheat and barley, primarily in the high areas of the watershed. The other half, primarily the bottomlands near streams, provides range for livestock. From November through March, cattle are typically fed along the valley floor, which serves as a refuge from the region's harsh winter weather.

This is a sparsely populated area. There are no towns in the watershed and no point sources of pollution. The few farmhouses are widely dispersed in the watershed, and there is no evidence that septic systems are contributing pollution to streams.

The impaired segments are:

- 18827, temperature, on Deadman Creek, between river kilometers 1.6 and 3.3.
- 18828, temperature, on Deadman Creek between river kilometers 16.4 and 18.3.
- 40555, fecal coliform, North Fork Deadman Creek, between river kilometers .6 and 2.2.
- 40534, temperature, on South Fork Deadman Creek, between river kilometers 1.2 and 2.5.
- 40554, fecal coliform, same segment as above temperature impairment.

The impaired segments are illustrated on the map on page 7.

For segments 40555, 40534, and 40554, Washington State University collected data in 2000 and 2001 that showed excursions above the criteria for temperature and fecal coliform. For segments 18827 and 18828, data collected by the Washington Department of Fish and Wildlife shows that the highest daily temperatures occurred in 2001. For segment 18827, data show a 7-day mean of maximum daily temperature of 24.3 degrees Centigrade, with a maximum daily temperature of 25.6 degrees Centigrade from continuous measurements. For segment 18828, data show a 7-day mean of maximum daily temperature of 20.7 degrees Centigrade, with a maximum daily temperature of 21.8 degrees Centigrade from continuous measurements.

The impairments are the result of a combination of factors. Winter feeding and uncontrolled livestock access to the stream had eliminated much of the vegetation within the stream corridor. This degraded riparian area could not provide shade to the stream, resulting in high water temperatures. It also allowed manure to run directly into streams. In addition, the uncontrolled stream access allowed cattle to deposit manure directly into the water and to trample streambanks. The creek was shallow, wide, and muddy in many areas due to cattle trampling, and provided little habitat for Steelhead trout.

Description of Pollution Controls and How They Will Achieve Water Quality Standards

Water Quality Target

The designated uses for temperature impaired segments 18828 and 40534 are spawning, rearing and migration, and the temperature criterion is 17.5 degrees Centigrade, year-round. The designated uses for temperature impaired segment 18827 are the same, but in addition, it has a supplemental spawning criterion of 13 degrees Centigrade from February 15 to June 1.

The designated use for fecal coliform impaired segments 40554 and 40555 is primary contact recreation. Fecal coliform levels must not exceed a geometric mean value of 100 colonies/100mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) exceeding 200 colonies/100mL.

Controls that will achieve water quality standards

The Department of Ecology's Eastern Regional Office has established a Livestock and Water Quality Program that uses a unique collaborative approach to address livestock-related problems. Instead of using the standard process that starts with a Category 5 listing, establishing a TMDL for the stream, writing an implementation plan, and finally getting to actual implementation, this strategy goes straight to implementation. The strategy is applied in watersheds in which the cause of water quality impairment is clear.

Ecology encourages implementation of a wide variety of best management practices, however, a primary focus of the program has been to restore degraded riparian corridors and eliminate unlimited animal access to streams. Healthy riparian areas can improve water quality and stream health in multiple ways, which make them a particularly valuable and cost-effective management practice. Healthy riparian areas

- Slow bank erosion by holding soil in place during periods of high water.
- Reduce flood damage and sedimentation by slowing runoff and capturing the sediment that would otherwise be carried downstream.
- Help keep water cool in summer by shading the stream.
- Improve water quality by capturing sediment, nutrients, pesticides, pathogens, and other pollutants before they reach the stream.
- Enhance summer stream flow by improving water infiltration and storage.
- Create fish and wildlife habitat.
- Limit livestock manure inputs to the creek and riparian areas.

Ecology has a three-step riparian restoration strategy, which allows the department to efficiently apply resources to priority problem areas. The first step is to address the source of degradation – unlimited livestock access to streams and winterfeeding operations in close proximity to the riparian corridor. Ecology relies primarily on livestock exclusion, and off-stream water supply to restrict livestock access to the riparian area. In implementing this BMP, Ecology uses NRCS riparian buffer standards, which requires a minimum 35 buffer between the livestock fence and the mean ordinary high water mark of the nearest stream bank. In many cases, the buffer width may be larger depending on the stream and site conditions.

By first addressing livestock access, Ecology seeks to abate the primary pollution sources—livestock in the stream, eroded streambanks, increased runoff, increased sedimentation, and subsequent transport of fecal matter. As vegetation naturally returns in the riparian area, site conditions become stabilized and the pollution sources are dramatically reduced. Also, this approach works to arrest morphological changes to the entire stream that are induced by erosion and sedimentation.

Ecology has spent much of its efforts and resources implementing this first step, in large part, because we have taken a holistic, watershed approach to protecting streams. By first addressing the primary sources of pollution and geomorphic change, Ecology can establish the necessary site conditions for successful restoration. Moreover, Ecology ensures that, first and foremost, the root problems are addressed for *the entire stream*, before resources are focused on site or segment specific restoration.

The second step occurs after a majority of site conditions have been stabilized, and the stream's entire geomorphic integrity is no longer jeopardized by the adjacent management practices. Ecology conducts a reach by reach assessment to determine the appropriate trees and shrubs to be used for restoration. Ecology is currently partnering with universities to study the genetic make-up of local riparian seed banks. Ecology then establishes nurseries to propagate the site appropriate plant material. In some cases federal programs require revegetation as part of the cost-share program, and so restoration work occurs simultaneously with livestock exclusion.

The third step is to work with local land owners to promote continuous and proper management of upland grazing lands.

Ecology teams with conservation districts, local governments, and landowners to provide technical assistance and funding for implementation of best management practices. Ecology uses a traditional regulatory process only when collaborative efforts fail. Chapter 90.48 RCW gives Ecology the authority to take enforcement actions against nonpoint polluters. We have, in fact, issued enforcement orders to two landowners in watersheds in which we are implementing the Livestock and Water Quality Program.

The result of these partnerships has been the implementation of best management practices at hundreds of sites where water quality and fish habitat issues exist. By using a

collaborative strategy, backed up by enforcement when necessary, Ecology has been able to create relationships and build trust with rural residents while improving water quality.

In the Deadman Creek watershed, work with landowners began in 2002. Twenty-nine miles of riparian buffers were installed. The creek was fenced to protect it from livestock, and several off-stream watering facilities were installed. Feeding locations were moved away from the stream to prevent polluted runoff. Trees and shrubs were planted to stabilize banks, shade the stream, and provide wildlife habitat. Buffers are constructed using Natural Resource Conservation Service standards, which require a minimum width of 35 feet. For buffers installed with state or federal financial assistance, we require an agreement with the landowner stipulating that the buffer and fence will be maintained for at least 10 years.

As shown on the map on page 7, fencing was generally installed adjacent to or upstream of the impaired segments. However, we are also fencing portions of the stream where there are presently no Category 5 listings, but where there is unrestricted cattle access to the stream. Riparian buffers are left to revegetate naturally in those areas in which there is enough live native vegetation left to recover. In all other areas we are installing buffers by planting native plants. At this time, 80 percent of the cattle have been fenced out of the stream. Ten percent more will be fenced out this year, and the final 10 percent in the following year.

Our experience has shown that it is not always necessary to create buffers on entire creeks in order to achieve compliance with standards. For instance, in this area, which is largely arid, not all riparian areas can support trees and shrubs. Also, many small streams pass through areas of ravines and steep topography, which naturally limit animal access and at the same time shade the stream. There are also some areas where cattle are not grazed, so the riparian areas are in good shape now.

One thing we expect to learn through this program is exactly how much riparian restoration is required to get these streams into compliance with water quality standards and keep them in compliance. For example, fences and riparian buffers not shown on the map have been installed on waterbodies that are not currently identified as being impaired: tributaries to the North Fork of Deadman Creek and higher up the South Fork. The intent of the Livestock and Water Quality Program is to restore the watershed so that all streams consistently comply with standards for all pollutants. We will continue installing buffers and other management practices until this goal is met.

The watershed has changed dramatically. Fish habitat and stream health are improving, and water quality data show that during most months, the stream is now meeting water quality standards.

Description of requirements under which pollution controls will be implemented

It is Ecology's best professional judgment that the pollution controls that have been installed will result in the water quality standards being met. Maintenance of these

controls has been ensured through 10-year landowner agreements that were established as part of the funding agreements for these projects.

Estimate or Projection of Time When Water Quality Standards Will be Met

It will take time for the riparian corridor to fully recover and for the stream to re-establish its natural geometry. Ecology estimates that the riparian buffers will have grown enough to be fully effective in 10 years, so Deadman Creek will be meeting temperature and fecal coliform standards throughout the entire watershed by 2017.

Schedule for Implementing Pollution Controls

As described earlier in this report, Ecology has worked with the conservation district, local governments, and landowners to implement a variety of best management practices in the Deadman Creek watershed, including installing 29 miles of riparian buffers. It is our best professional judgment that this work will remedy the pollution problems in the impaired segments. Because it is our intention to restore the entire watershed and to prevent future pollution problems, we will be using monitoring data to track water quality improvements and to identify any new problem areas so they can be addressed. It will be an on-going process to get water bodies into compliance and to keep them in compliance.

A few sites where cattle are adversely affecting water quality remain in the watershed, and Ecology's Livestock and Water Quality Program will continue working with landowners to address these problem areas. As mentioned above, at this time, 80 percent of the cattle have been fenced out of the stream. The program plans to fence out an additional 10 percent this year and the final ten percent in the following year.

In addition, farmers throughout the watershed are adopting conservation tillage practices that reduce soil erosion and keep sediment out of the stream. These practices also improve rain and snowmelt infiltration and reduce the change of damaging spring floods. A new challenge in the watershed is a noxious weed called False Indigo. As cattle are excluded from the stream corridor, this aggressive invader moves in. The Pomeroy Conservation District has a grant from the Department of Ecology to remove the weed and plant native trees and shrubs in its place. Ecology's livestock and water quality program will continue to have an on-going presence in the watershed, and will continue working to achieve compliance with state water quality standards.

We will use monitoring data and evidence of additional work completed in this watershed to determine whether these listings will stay in Category 4b in the next Water Quality Assessment.

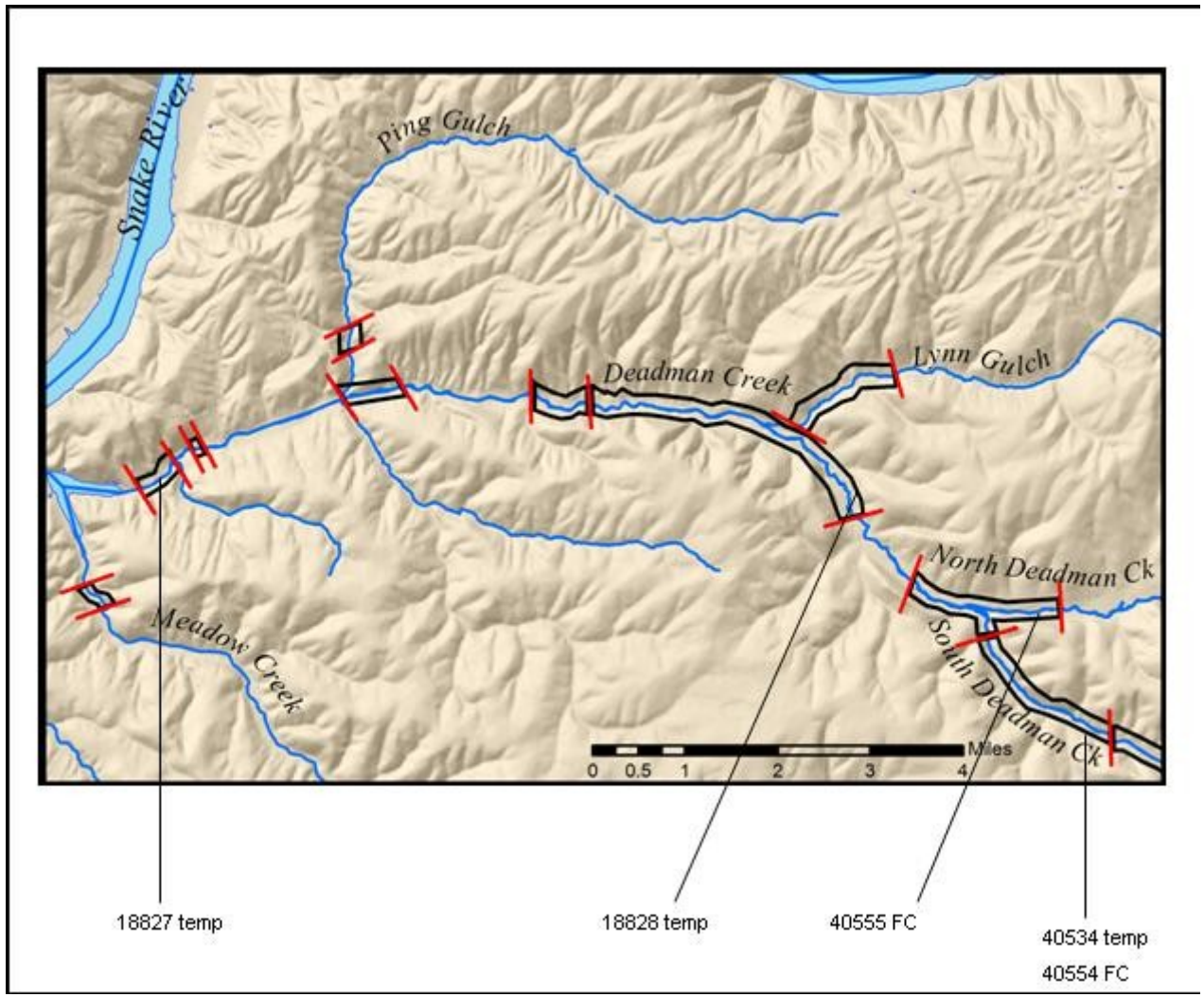
Monitoring Plan to Track Effectiveness of Pollution Controls

Ecology is presently working with the conservation district to develop a monitoring plan and obtain funding. Monitoring results will be used to establish whether these projects are improving water quality and overall stream health. Monitoring data can also help to

identify additional problem areas that should be addressed. Monitoring results will be reported to the public and EPA through Ecology's IR report development process.

Commitment to Revise Pollution Controls as Necessary

Ecology will maintain a presence in the Deadman Creek watershed to ensure that water quality continues to improve. We fully expect the Eastern Regional Office Livestock and Water Quality Program to achieve compliance with water quality standards. However, if it does not, Ecology will work with the conservation district, local governments, and landowners to determine other controls that could be used to achieve compliance.



Map shows locations of fencing installed, shown by black lines, which are not to scale. In areas in which some riparian vegetation was intact and expected to recover once cattle were removed, we are depending on natural revegetation. In all other areas riparian buffers were installed by planting native plants. Part of the project is to continually assess condition of the buffers and to plant or replant those that are not recovering quickly enough.

Category 4b listings are labeled by listing identification number and pollutant.